VII. *An Account of a very large* Stone, *found in the* Colon *of a* Horſe; *and of ſeveral* Stones, *which were taken from the* Inteſtines *of a* Mare; *with ſome Experiments and Obſervations thereupon, by* Edward Bailey, *M.D. of* Havant *in* Hampſhire.

Read Dec. 11, 1746.

THE Horſe in which the large Stone was found, belonged to a Miller in this Neighbourhood, and had been fed with Bran only for ſeveral Years. He was obſerved to be in Pain ſometimes, but never ſo bad as to be hindered from his Work, till the Day of his Death; when he was taken on the Road with Symptoms of violent Pain, and wanted to lie down: However, the Carter drove him home; but, as ſoon as he had unharneſſed him, the poor Creature was ſeized with a great Shaking, and dropp'd down dead immediately.

The Man who ſtripp'd him, obſerving a Swelling in his Belly, open'd it, and found in the *Colon* a very large Stone, but preſently broke it in Pieces.

I did not hear of this Stone till the latter End of laſt Summer, when a Gentleman ſhew'd me a Fragment of it; which excited my Curioſity to go to the Mill where the Horſe died, to inquire for the Remains. I found ſeveral Pieces of it, weighing in all one Pound ſix Ounces and an half *Troy* Weight. Some of them have been kept dry in the Mill, but the greateſt Part laid abroad mixed with Rubbiſh; which, tho' expoſed to the Weather above twelve Months,

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Months, was not much altered, being only a little more brittle than the reſt, and ſomewhat mouldered on the Outſide.

About a Fortnight ago, another Piece of the ſame Stone was brought to me, weighing about eight Ounces *Troy*, containing near half the *Nucleus* and the innermoſt *Laminæ* cohering together.

From all theſe Fragments, and the Deſcription of the Stone given me by thoſe who ſaw it, before it was broken in Pieces, it appears to have been of a ſpheroidal Figure, about 16 Inches in Circumference, conſiſting of a *Nucleus* and ſeveral *Laminæ* or Shells involving one another; ſome of them are parted from each other, but the reſt ſtick ſo cloſe together, that they cannot be ſeparated without breaking. All the *Laminæ* are compos'd of tranſverſe *Striæ*, with their Points converging like Rays towards the Centre of the *Nucleus*. They are of a brown Colour, and ſhine like Reſin. The *Nucleus* is of an oval Figure, and differs but little in its Compoſition from the reſt of the Stone, having no other extraneous Matter in it but a few Pieces of Straw, and ſmall Sticks, like the Twigs of a Broom; ſome of them appear intermixed with the *Striæ* throughout the Body of the Stone. The external Surface of the Stone, and thoſe *Laminæ* that have been expoſed to the Air, look of an Aſh-Colour, are pretty even, but not very ſmooth, having many ſmall Holes in them. *See* TAB. III. *Fig.* 1, 2, 3.

About the Beginning of laſt *July*, five large Stones were found lying near one another in the Inteſtines of a Mare, which belonged to a Carrier in this

Town,

Town, who had us'd her ſeveral Years in his Team. She was in good Caſe, and always appear'd to be ſound and healthy; till one Morning, being at Graſs, ſhe was found lying on the Ground in a great Agony of Pain, with which ſhe was continually tortured for about ſix Hours, without any Relief from various Remedies which were applied: At laſt ſhe got up, and ran about the Field like a mad Creature, till ſhe died.

I have ſeen but two of the Stones which were taken from her; one of a triangular Shape, the other oblong, a little depreſſed in the Middle, bearing ſome Reſemblance to a Horſe-Bean. (*See* TAB. III. *Fig.* 4, 7.) They are both ſimilar in Subſtance, and ſeem to be of the Bezoar-Kind, being of a cloſer Texture than that above deſcribed, of an Olive-Colour, and finely poliſhed.

The other three, as I am informed, were of the ſame Colour and Texture, and one of them larger than either of theſe, and of the Shape that at *Fig.* 7.

EXPERIMENTS.

Theſe two Stones, being ſaw'd aſunder, look'd like poliſhed Marble; and were found to contain a Piece of an iron Nail in the Middle.

The triangular Stone weigh'd 75 Grains above $3\frac{1}{2}$ Ounces *Troy*. The other, being the larger, weigh'd but $2\frac{1}{2}$ Grains ſhort of 16 Ounces *Troy* Weight.

A Fragment of the leſſer Stone, which in the Air weigh'd Gr. $103\frac{6}{10}$, in Water weigh'd Gr. $42\frac{6}{10}$; ſo that

that this Stone is in ſpecific Gravity to Water as 170 to 100.

A Fragment of the greater Stone, which weigh'd in Air Gr. 83 $\frac{7}{10}$; weigh'd in Water of the ſame Degree of Warmth, Gr. 34 $\frac{7}{10}$; ſo that the ſpecific Gravity of this is the ſame as of the other.

A Quantity of the larger Stone, weighing four Ounces, being diſtill'd in a coated Retort, yielded Gr. 37 $\frac{7}{10}$ above 20 Ounces of a ſtrong alcaline Spirit, of a brown Colour, ſuch as is drawn from Hart's-horn; leaving a black Coal weighing Gr. 74 $\frac{1}{10}$ ſhort of 2 Ounces; Gr. 36 $\frac{7}{10}$ being converted into Air, and otherwiſe loſt in collecting the Produce of the Diſtillation; a ſmall Quantity of black Oil adher'd to the Neck of the Receiver, and a few Drops of this Oil appear'd in the Spirit, when it was firſt pour'd off; but, after ſtanding ſome time, fell to the Bottom in the Form of a black Sediment.

The black Coal, calcined under a Muffle in a very ſtrong Fire, loſt but 22 Grains, and became a white inſipid Earth.

A Fragment of the great Stone, which had lain expoſed to the Air and Weather above twelve Months, as mention'd above, weighing in the Air Gr. 58, weigh'd in Water Gr. 24 $\frac{4}{10}$, after it had ſtood a conſiderable Time, that the Water might enter its Cavities: So that this Stone, tho' ſeeming of a looſe Texture, came out not much inferior to the other in ſpecific Gravity; this being to Water as 165 to 100.

A

A Portion of this Stone, in a ſtrong open Fire, loſt in Calcination juſt half its Weight; becoming, as the former, a white inſipid Earth; which, being infuſed in boiling Water, made no Alteration in its Colour, Taſte, nor Smell.

Three Ounces of this Stone diſtill'd, produc'd Gr. 24$\frac{1}{2}$ more than an Ounce and a Quarter of the like alkaline Spirit as the former yielded, and left a black Coal, weighing Gr. 16$\frac{7}{10}$ above an Ounce and half.

From this chemical Analyſis it appears, that theſe Stones are compounded chiefly of Earth, a large Quantity of volatile alkaline Salt and Water, ſome Oil, and a ſmall Quantity of Air.

From hence it likewiſe appears, that the component Principles of theſe Stones bear a nearer Reſemblance to thoſe of Hartſhorn than that of the *Calculus humanus*: For, according to Dr. *Hales*'s Account, in his *Vegetable Statics*, Experiment N°. 51. 241 Grains of Deer's Horn being diſtill'd left a *Calx* weighing Gr. 128; *viz.* above half its Weight; which ſhews that Horn contains much about the ſame Quantity of Earth as theſe Stones do: Whereas the *Calculus humanus*, when diſtill'd, affords but a ſmall Quantity of Earth, Spirit, or Oil; the greateſt Part of it being converted into Air.

Half an Ounce of the Stone (*Fig.* 7. TAB. III.) being powder'd and infuſed in four Ounces of boiling Water, made it ſmell ſtrongly of Horſe-Dung, and gave it a diſagreeable Taſte, while it was hot; but,

but, when the Infuſion grew cold, it loſt its Taſte and Smell, and the Water, after ſtanding ſome time, became, without being filtred, as pale and clear as before; nor did the Mixture of it with Oil of Tartar, Oil of Vitriol, nor *Aqua fortis*, produce any Alteration in it. This Experiment, being repeated ſeveral times, by infuſing boiling Water on the ſame Powder, was attended with the ſame Effects, tho' near two Months paſs'd between the firſt and laſt Infuſions. The Powder, after the firſt Infuſion, appear'd like Mud of two different Colours and Conſiſtencies; the upper Part being ſofter, and of a lighter Colour, the under of a dark-brown, feeling hard like Sand. This Difference in the Colour and Texture of the Sediment remain'd in all the Infuſions.

A ſmall Piece of the ſame, and another of the biggeſt Stone, being let fall into boiling Water, ſunk immediately, and continued at the Bottom, without riſing at all, tho' the Water was kept boiling a conſiderable Time: Which ſhews, that theſe Stones are ſpecifically heavier than the Stone found in the Stomach of a Horſe, which Mr. *Watſon* gives an Account of in the *Philoſ. Tranſ.* N°. 475. and alſo, that their conſtituent Principles are more firmly united together than thoſe of that Stone; two Pieces of which, being let fall into Water almoſt boiling, immediately ſunk, but roſe again, and continued alternately riſing and ſinking a conſiderable time: And, as that Gentleman obſerves, the Powder of that Stone being infuſed in boiling Water, the Infuſion,

fuſion, when cold and filtred, was of a light-brown Colour; whereas the Colour of the Water was not changed in either of the above-mentioned Infuſions; neither did any Ebullition enſue upon the Mixture of them with Oil of Tartar, Vitriol, *&c.*

I try'd to diſſolve theſe Stones, by digeſting ſmall Pieces of them in the ſtrongeſt acid and alkaline *Menſtrua, viz.* Spirit of Salt, Sulphur, Oil of Vitriol, *Aqua fortis*, and capital Soap-Lees, *&c.* and at the ſame time try'd the Effects of thoſe *Menſtrua* on ſeveral Stones, which were given me by ſome of my Patients, who voided them. They were ſoftened by ſome of them, but not totally diſſolved by any, except the Oil of Vitriol and *Aqua fortis:* Nor did the *Aqua fortis* cauſe any Ebullition in diſſolving them, as it did in the Solution of the *Calculus humanus*, which was attended with a briſk Ebullition, and hiſſing Noiſe, ariſing from the Eruption of the Air Bubbles from it: Which confirms what I obſerv'd above, that theſe Stones contain but a very ſmall Quantity of Air, and that their ſaline and oily Particles are ſo cloſely combined with Earth, as not to be extracted without a ſtrong Fire.

Havant, Nov. 27.
1746.

Explication of the Figures.

TABLE III.

The firſt three Figures exhibit three Views taken from ſeveral Parts of the great Stone found in the Horſe.

Figure 1.

Repreſents a Fragment of it, containing Part of the *Nucleus* and the adjoining Shells or Incruſtations.

a, The *Nucleus* or Center.

bb, The firſt Stone or Incruſtation formed upon the *Nucleus*.

cccc, The ſecond Incruſtation, cover'd with a ſmooth Shell or Coat *dd*.

ee, The third Incruſtation, which appears through the broken Shell of *Fig.* 2.

ffff, The ſmooth Shell or Coat of this Incruſtation, which forms the Outſide of *Fig.* 2.

hhhh, The fourth or outermoſt Incruſtation, conſiſting of three Layers or Shells.

Fig. 2. Shews the external Surface of the third Incruſtation.

ffff, The Shell almoſt intire, but broken off at *gg*.

ee, Part of the third Incruſtation.

Fig. 3. Shews a Fragment conſiſting of Part of the three outermoſt Shells of the fourth Incruſtation.

The Letters *ff* and *hh* anſwer to thoſe of *Fig.* 1 and *Fig.* 2. only the concave Part *fi*, *fi*, is what fitted and joined to the round Surface of *Fig.* 2.

The following Figures ſhew ſeveral Views of the two Stones found in the Mare.

Fig. 4. Repreſents the triangular Stone.

Fig. 5, 6. Repreſent the ſame ſawn aſunder, ſhewing the Diviſions of the ſeveral Shells, with the *Nucleus* and the End of the iron Nail projecting from the Centre.

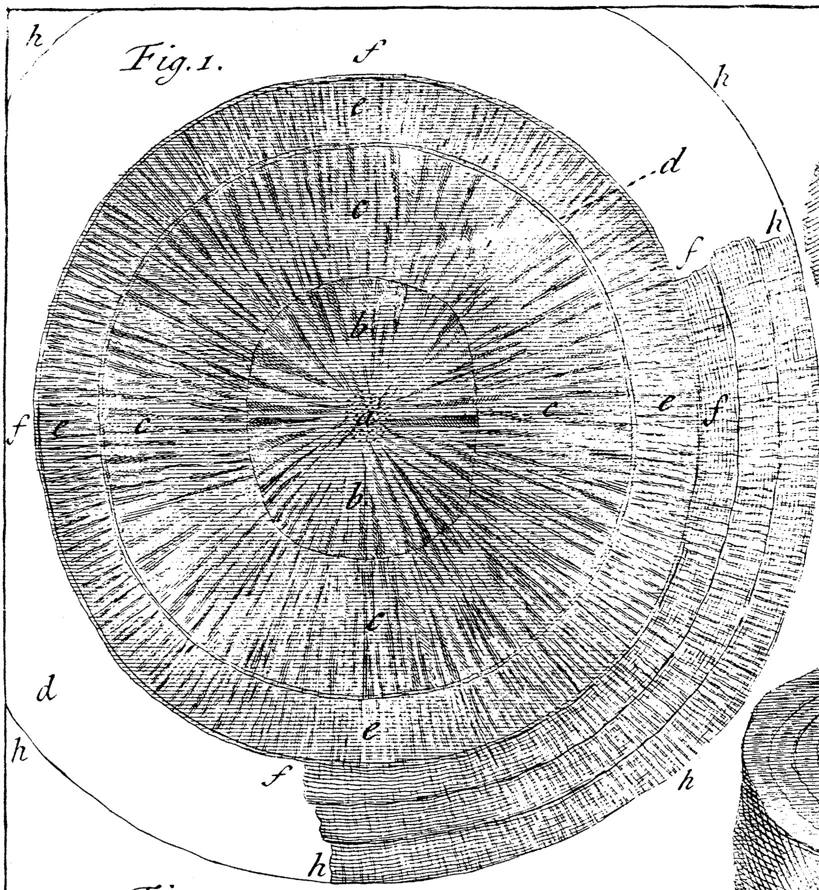
Fig. 7. Exhibits the larger Stone intire.

Fig. 8. Part of the ſame ſawn off, repreſenting the ſeveral Shells, with one Piece of the iron Nail in the Middle.

Fig. 9. The other Piece of the Nail that was ſawn off.

N. B. One of the three Stones mentioned *p.* 298. is lately come to Hand; it meaſures round twelve Inches one Way, and eleven Inches another Way. This Stone, together with all the above-mention'd, and the ſeveral chemical Preparations produced from them, are repoſited in the *Muſeum* of his Grace the Duke of *Richmond*.

Fig. 1.



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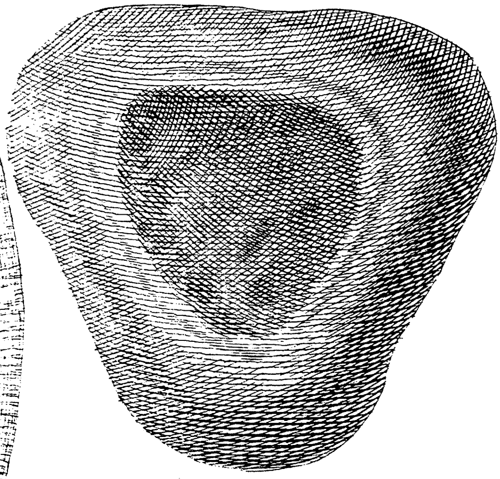

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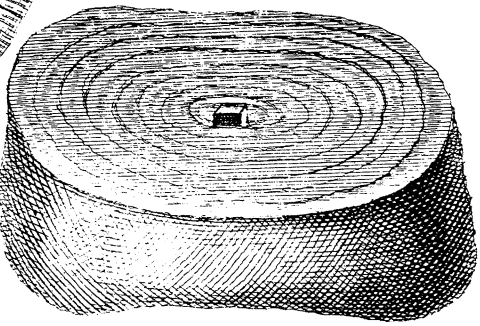

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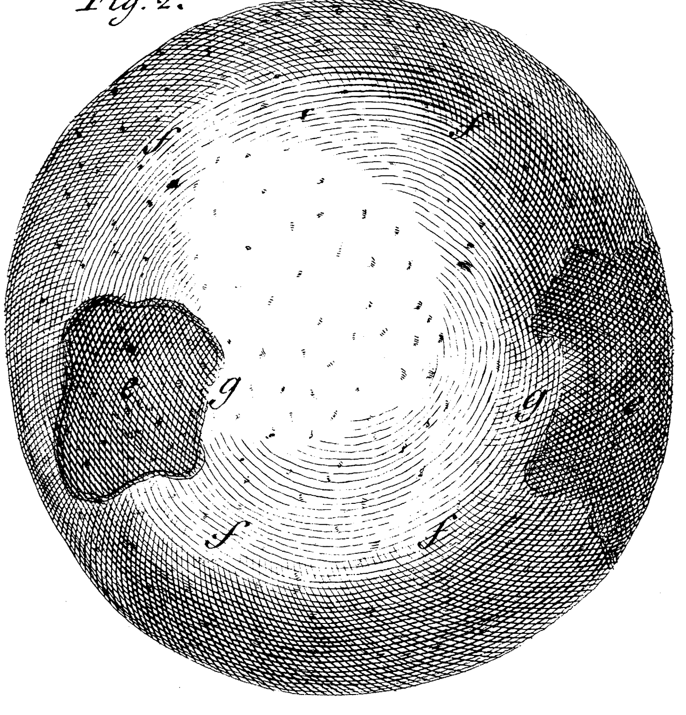

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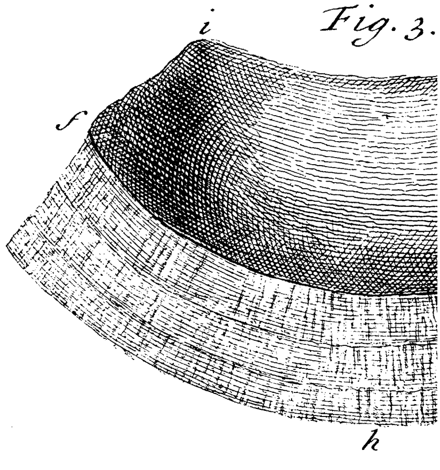

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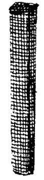
Fig. 9



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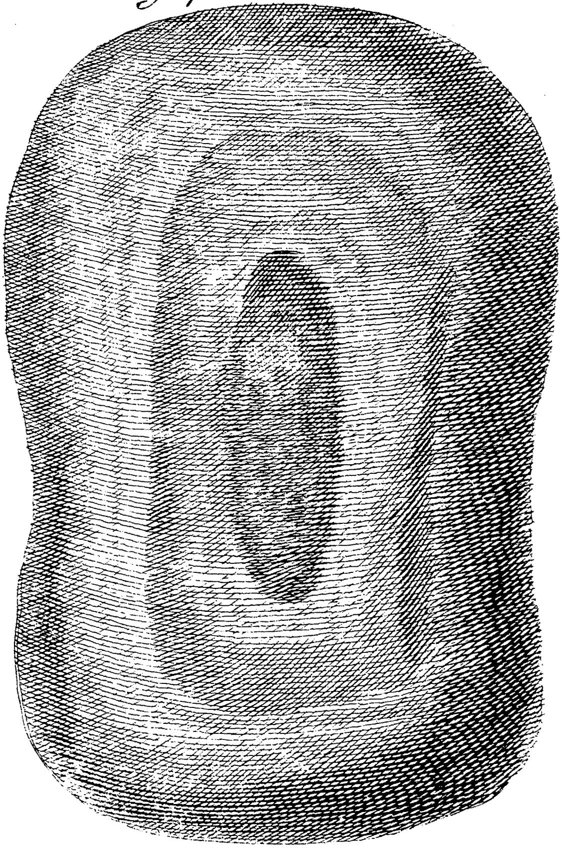

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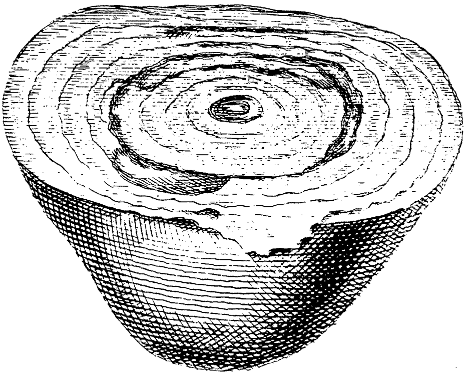

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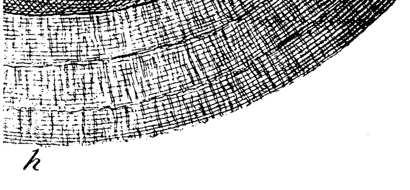

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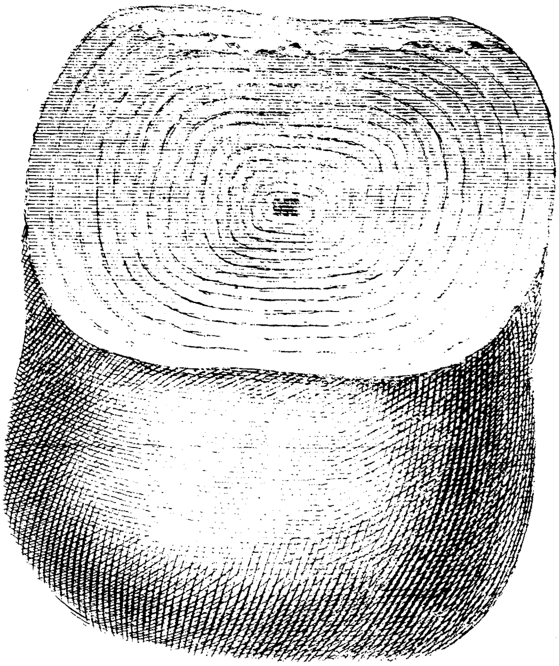

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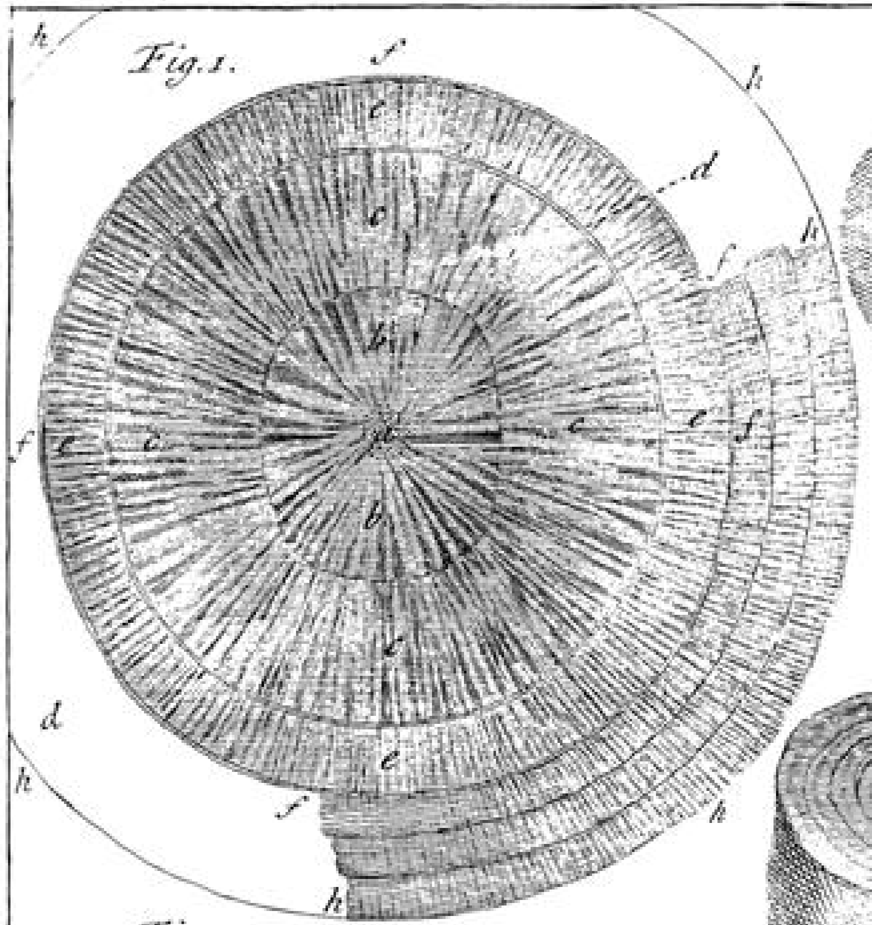
Fig. 1.



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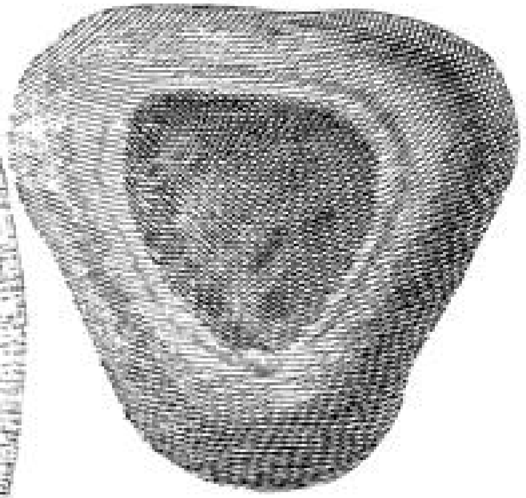

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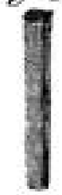

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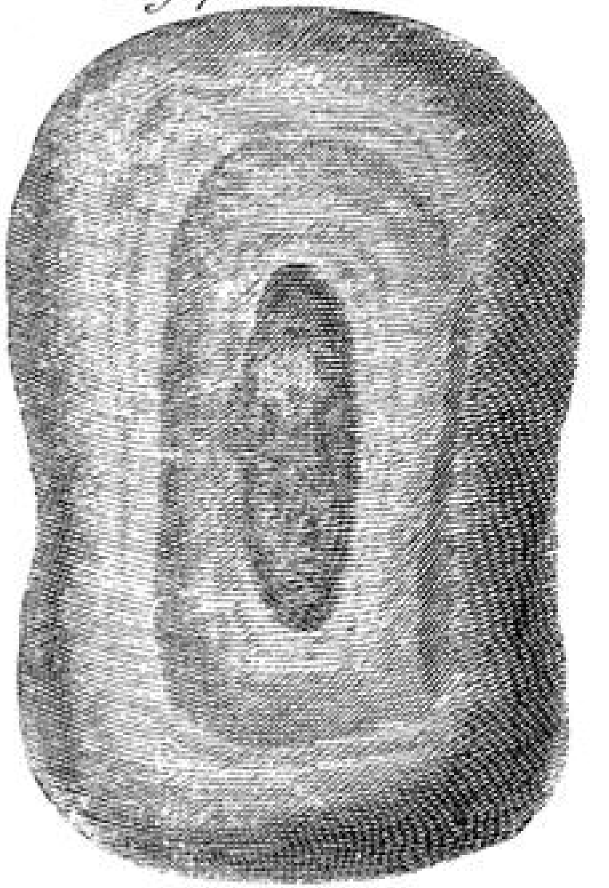
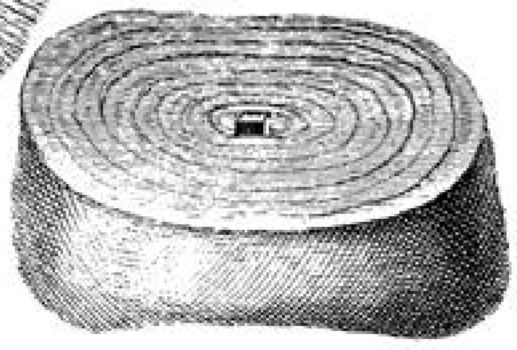


Fig. 5.



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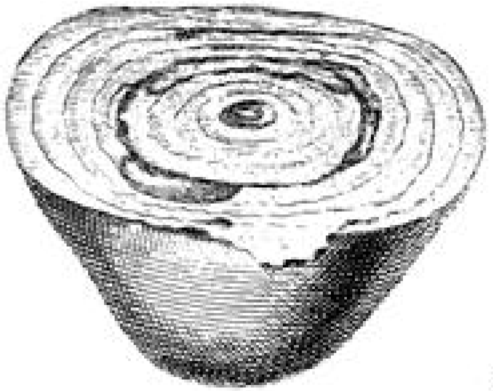

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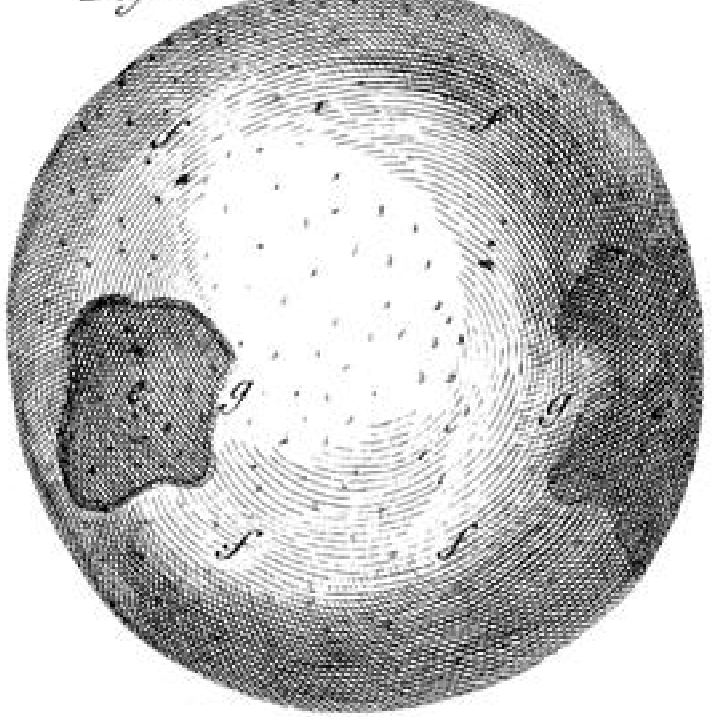

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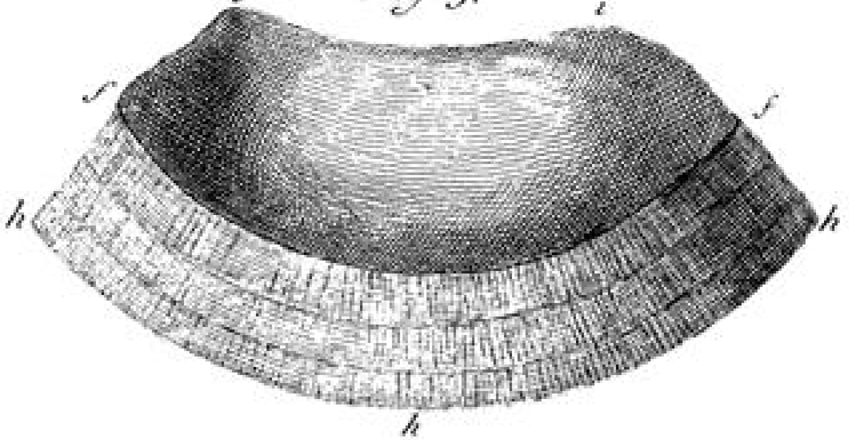

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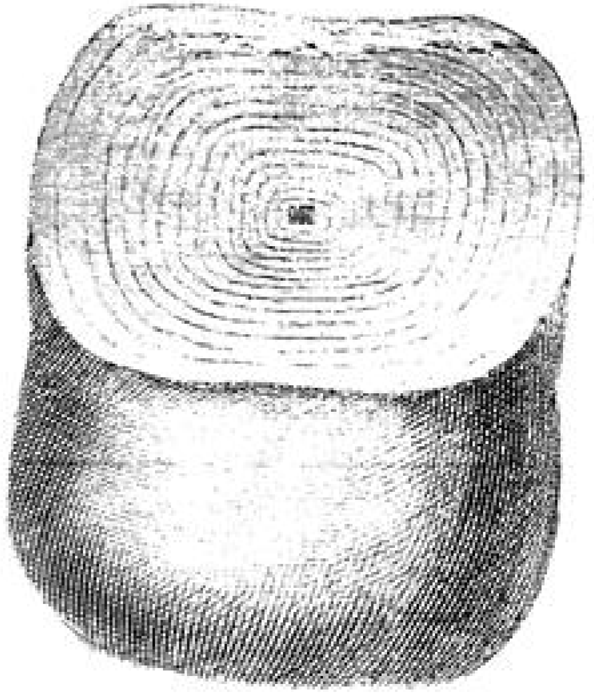

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